



SEQUENCE LISTING

<110> Bertin, John

<120> NOVEL MOLECULES OF THE CARD-RELATED
PROTEIN FAMILY AND USES THEREOF

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<140> 09/767,215

<141> 2001-01-22

<150> 60/181,159

<151> 2000-02-09

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actgcgggga ctgtggaccc caccctgctg cacggagctc ctgcaaaagc aaacctgaga      180
accttgggtc ctcccagcgc ccagcc atg ggg gaa ctg tgc cgc agg gac tcc      233
                               Met Gly Glu Leu Cys Arg Arg Asp Ser
                               1               5
```

```
gca ctc acg gca ctg gac gag gag aca ctg tgg gag atg atg gag agc      281
Ala Leu Thr Ala Leu Asp Glu Glu Thr Leu Trp Glu Met Met Glu Ser
 10                15                20                25
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cac cgc cac agg atc gta cgc tgc atc tgc ccc agc cgc ctc acc ccc      329
His Arg His Arg Ile Val Arg Cys Ile Cys Pro Ser Arg Leu Thr Pro
 30                35                40
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tac ctg cgc cag gcc aag gtg ctg tgc cag ctg gac gag gag gag gtg      377
Tyr Leu Arg Gln Ala Lys Val Leu Cys Gln Leu Asp Glu Glu Glu Val
 45                50                55
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ctg cac agc ccc cgg ctc acc aac agc gcc atg cgg gcc ggg cac ttg      425
Leu His Ser Pro Arg Leu Thr Asn Ser Ala Met Arg Ala Gly His Leu
 60                65                70
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ctg gat ttg ctg aag act cga ggg aag aac ggg gcc atc gcc ttc ctg      473
Leu Asp Leu Leu Lys Thr Arg Gly Lys Asn Gly Ala Ile Ala Phe Leu
 75                80                85
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| | |
|---|------|
| gag agc ctg aag ttc cac aac cct gac gtc tac acc ctg gtc acc ggg | 521 |
| Glu Ser Leu Lys Phe His Asn Pro Asp Val Tyr Thr Leu Val Thr Gly | |
| 90 95 100 105 | |
| ctg cag cct gat gtt gac ttc agt aac ttt agc ggt ctc atg gag aca | 569 |
| Leu Gln Pro Asp Val Asp Phe Ser Asn Phe Ser Gly Leu Met Glu Thr | |
| 110 115 120 | |
| tcc aag ctg acc gag tgc ctg gct ggg gcc atc ggc agc ctg cag gag | 617 |
| Ser Lys Leu Thr Glu Cys Leu Ala Gly Ala Ile Gly Ser Leu Gln Glu | |
| 125 130 135 | |
| gag ctg aac cag gaa aag ggg cag aag gag gtg ctg ctg cgg cgg tgc | 665 |
| Glu Leu Asn Gln Glu Lys Gly Gln Lys Glu Val Leu Leu Arg Arg Cys | |
| 140 145 150 | |
| cag cag ctg cag gag cac ctg ggc ctg gcc gag acc cgt gcc gag ggc | 713 |
| Gln Gln Leu Gln Glu His Leu Gly Leu Ala Glu Thr Arg Ala Glu Gly | |
| 155 160 165 | |
| ctg cac cag ctg gag gct gac cac agc cgc atg aag cgt gag gtt agc | 761 |
| Leu His Gln Leu Glu Ala Asp His Ser Arg Met Lys Arg Glu Val Ser | |
| 170 175 180 185 | |
| gca cac ttc cat gag gtg ctg agg ctg aag gac gag atg ctc agc ctc | 809 |
| Ala His Phe His Glu Val Leu Arg Leu Lys Asp Glu Met Leu Ser Leu | |
| 190 195 200 | |
| tcg ctg cac tat agc aat gcg ctg cag gag aag gag ctg gcc gcc tca | 857 |
| Ser Leu His Tyr Ser Asn Ala Leu Gln Glu Lys Glu Leu Ala Ala Ser | |
| 205 210 215 | |
| cgc tgc cgc agc ctg cag gag gag ctg tat cta ctg aag cag gag ctg | 905 |
| Arg Cys Arg Ser Leu Gln Glu Leu Tyr Leu Leu Lys Gln Glu Leu | |
| 220 225 230 | |
| cag cga gcc aac atg gtt tcc tcc tgt gag ctg gaa ttg caa gag cag | 953 |
| Gln Arg Ala Asn Met Val Ser Ser Cys Glu Leu Glu Leu Gln Glu Gln | |
| 235 240 245 | |
| tcc ctg agg aca gcc agc gac cag gag tcc ggg gat gag gag ctg aac | 1001 |
| Ser Leu Arg Thr Ala Ser Asp Gln Glu Ser Gly Asp Glu Glu Leu Asn | |
| 250 255 260 265 | |
| cgc ctg aag gag gag aat gag aaa ctg cgc tcg ctg act ttc agc ctg | 1049 |
| Arg Leu Lys Glu Glu Asn Glu Lys Leu Arg Ser Leu Thr Phe Ser Leu | |
| 270 275 280 | |
| gcg gag aag gac att ctg gag cag agc ctg gac gag gcg cgg ggg agc | 1097 |
| Ala Glu Lys Asp Ile Leu Glu Gln Ser Leu Asp Glu Ala Arg Gly Ser | |
| 285 290 295 | |
| cga cag gag ctg gtg gag cgc atc cac tcg ctg cgg gag cgg gcc gtg | 1145 |
| Arg Gln Glu Leu Val Glu Arg Ile His Ser Leu Arg Glu Arg Ala Val | |
| 300 305 310 | |
| gct gcc gag agg cag cga gag cag tac tgg gaa gag aag gaa cag acc | 1193 |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Ala | Ala | Glu | Arg | Gln | Arg | Glu | Gln | Tyr | Trp | Glu | Glu | Lys | Glu | Gln | Thr | | |
| 315 | | | | | | 320 | | | | | 325 | | | | | | |
| ctg | ctg | cag | ttc | cag | aag | agt | aag | atg | gcc | tgc | caa | ctc | tac | agg | gag | 1241 | |
| Leu | Leu | Gln | Phe | Gln | Lys | Ser | Lys | Met | Ala | Cys | Gln | Leu | Tyr | Arg | Glu | | |
| 330 | | | | | 335 | | | | | 340 | | | | | 345 | | |
| aag | gtg | aat | gcg | ctg | cag | gcc | cag | gtg | tgc | gag | ctg | cag | aag | gag | cga | 1289 | |
| Lys | Val | Asn | Ala | Leu | Gln | Ala | Gln | Val | Cys | Glu | Leu | Gln | Lys | Glu | Arg | | |
| | | | | 350 | | | | | 355 | | | | | | 360 | | |
| gac | cag | gcg | tac | tcc | gcg | agg | gac | agt | gct | cag | agg | gag | att | tcc | cag | 1337 | |
| Asp | Gln | Ala | Tyr | Ser | Ala | Arg | Asp | Ser | Ala | Gln | Arg | Glu | Ile | Ser | Gln | | |
| | | | 365 | | | | | 370 | | | | | | 375 | | | |
| agc | ctg | gtg | gag | aag | gac | tcc | ctc | cgc | agg | cag | gtg | ttc | gag | ctg | acg | 1385 | |
| Ser | Leu | Val | Glu | Lys | Asp | Ser | Leu | Arg | Arg | Gln | Val | Phe | Glu | Leu | Thr | | |
| | | | 380 | | | | | 385 | | | | | | | | | |
| gac | cag | gtc | tgc | gag | ctg | cgc | aca | cag | ctt | cgc | cag | ctg | cag | gca | gag | 1433 | |
| Asp | Gln | Val | Cys | Glu | Leu | Arg | Thr | Gln | Leu | Arg | Gln | Leu | Gln | Ala | Glu | | |
| | | | 395 | | | 400 | | | | | 405 | | | | | | |
| cct | ccg | ggt | gtg | ctc | aag | cag | gaa | gcc | agg | acc | agg | gag | ccc | tgt | cca | 1481 | |
| Pro | Pro | Gly | Val | Leu | Lys | Gln | Glu | Ala | Arg | Thr | Arg | Glu | Pro | Cys | Pro | | |
| 410 | | | | | 415 | | | | | 420 | | | | | 425 | | |
| cgg | gag | aag | cag | cgg | ctg | gtg | cgg | atg | cat | gcc | atc | tgc | ccc | aga | gac | 1529 | |
| Arg | Glu | Lys | Gln | Arg | Leu | Val | Arg | Met | His | Ala | Ile | Cys | Pro | Arg | Asp | | |
| | | | | 430 | | | | | 435 | | | | | | 440 | | |
| gac | agc | gac | tgc | agc | ctc | gtc | agc | tcc | aca | gag | tct | cag | ctc | ttg | tcg | 1577 | |
| Asp | Ser | Asp | Cys | Ser | Leu | Val | Ser | Ser | Thr | Glu | Ser | Gln | Leu | Leu | Ser | | |
| | | | 445 | | | | | 450 | | | | | | 455 | | | |
| gac | ctg | agt | gcc | acg | tcc | agc | cgc | gag | ctg | gtg | gac | agc | ttc | cgc | tcc | 1625 | |
| Asp | Leu | Ser | Ala | Thr | Ser | Ser | Arg | Glu | Leu | Val | Asp | Ser | Phe | Arg | Ser | | |
| | | | 460 | | | | 465 | | | | | 470 | | | | | |
| agc | agc | ccc | gcg | ccc | ccc | agc | cag | cag | tcc | ctg | tac | aag | cgg | gtg | gcc | 1673 | |
| Ser | Ser | Pro | Ala | Pro | Pro | Ser | Gln | Gln | Ser | Leu | Tyr | Lys | Arg | Val | Ala | | |
| | | | 475 | | | 480 | | | | | 485 | | | | | | |
| gag | gac | ttc | ggg | gaa | gaa | ccc | tgg | tct | ttc | agc | agc | tgc | ctg | gag | atc | 1721 | |
| Glu | Asp | Phe | Gly | Glu | Glu | Pro | Trp | Ser | Phe | Ser | Ser | Cys | Leu | Glu | Ile | | |
| 490 | | | | | 495 | | | | | 500 | | | | | 505 | | |
| ccg | gag | gga | gac | ccg | gga | gcc | ctg | ccg | gga | gct | aag | gca | ggc | gac | cca | 1769 | |
| Pro | Glu | Gly | Asp | Pro | Gly | Ala | Leu | Pro | Gly | Ala | Lys | Ala | Gly | Asp | Pro | | |
| | | | | 510 | | | | | 515 | | | | | 520 | | | |
| cac | ctg | gat | tat | gag | ctc | cta | gac | acg | gca | gac | ctt | ccg | cag | ctg | gaa | 1817 | |
| His | Leu | Asp | Tyr | Glu | Leu | Leu | Asp | Thr | Ala | Asp | Leu | Pro | Gln | Leu | Glu | | |
| | | | 525 | | | | | 530 | | | | | 535 | | | | |
| agc | agc | ctg | cag | cca | gtc | tcc | cct | gga | agg | ctt | gat | gtc | tcg | gag | agc | 1865 | |
| Ser | Ser | Leu | Gln | Pro | Val | Ser | Pro | Gly | Arg | Leu | Asp | Val | Ser | Glu | Ser | | |

| 540 | 545 | 550 | |
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| ggc gtc ctc atg cgg cgg agg cca gcc cgc agg atc ctg agc cag gtc Gly Val Leu Met Arg Arg Arg Pro Ala Arg Arg Ile Leu Ser Gln Val 555 560 565 | | | 1913 |
| acc atg ctg gcg ttc cag ggg gat gca ttg ctg gag cag atc agc gtc Thr Met Leu Ala Phe Gln Gly Asp Ala Leu Leu Glu Gln Ile Ser Val 570 575 580 585 | | | 1961 |
| atc ggc ggg aac ctc acg ggc atc ttc atc cac cgg gtc acc ccg ggc Ile Gly Gly Asn Leu Thr Gly Ile Phe Ile His Arg Val Thr Pro Gly 590 595 600 | | | 2009 |
| tcg gcg gcg gac cag atg gcc ttg cgc ccg ggc acc cag att gtg atg Ser Ala Ala Asp Gln Met Ala Leu Arg Pro Gly Thr Gln Ile Val Met 605 610 615 | | | 2057 |
| gtt gat tac gaa gcc tca gag ccc ttg ttc aag gca gtc ctg gag gac Val Asp Tyr Glu Ala Ser Glu Pro Leu Phe Lys Ala Val Leu Glu Asp 620 625 630 | | | 2105 |
| acg acc ctg gag gag gcc gtg ggg ctt ctc agg agg gtg gac ggc ttc Thr Thr Leu Glu Glu Ala Val Gly Leu Leu Arg Arg Val Asp Gly Phe 635 640 645 | | | 2153 |
| tgc tgc ctg tct gtg aag gtc aac acg gac ggt tat aag agg cta ctc Cys Cys Leu Ser Val Lys Val Asn Thr Asp Gly Tyr Lys Arg Leu Leu 650 655 660 665 | | | 2201 |
| cag gac ctg gag gcc aaa gtg gcg acc tcg ggg gac tca ttc tac atc Gln Asp Leu Glu Ala Lys Val Ala Thr Ser Gly Asp Ser Phe Tyr Ile 670 675 680 | | | 2249 |
| cgg gtc aac ctg gcc atg gag ggc agg gcc aaa ggg gag ctg cag gtg Arg Val Asn Leu Ala Met Glu Gly Arg Ala Lys Gly Glu Leu Gln Val 685 690 695 | | | 2297 |
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| ggc tgc tgg cat gcc cac cgc gtg aac tct tac acc atg aag gat act Gly Cys Trp His Ala His Arg Val Asn Ser Tyr Thr Met Lys Asp Thr 715 720 725 | | | 2393 |
| gcc gcg cac ggc acc atc ccc aac tac tcc agg gct cag cag cag ctc Ala Ala His Gly Thr Ile Pro Asn Tyr Ser Arg Ala Gln Gln Gln Leu 730 735 740 745 | | | 2441 |
| ata gcc ctc atc cag gac atg act cag cag tgc acc gtg acc cgc aag Ile Ala Leu Ile Gln Asp Met Thr Gln Gln Cys Thr Val Thr Arg Lys 750 755 760 | | | 2489 |
| cca tct tct ggg gga cca cag aag ctg gtc cgc atc gtc agt atg gac Pro Ser Ser Gly Gly Pro Gln Lys Leu Val Arg Ile Val Ser Met Asp 765 770 775 | | | 2537 |

| | |
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| aaa gcc aag gcc agc cct ctg cgt ttg tcc ttt gac agg ggc cag ttg | 2585 |
| Lys Ala Lys Ala Ser Pro Leu Arg Leu Ser Phe Asp Arg Gly Gln Leu | |
| 780 785 790 | |
| gac ccc agc agg atg gag ggc tcc agc acg tgc ttc tgg gcc gag agc | 2633 |
| Asp Pro Ser Arg Met Glu Gly Ser Ser Thr Cys Phe Trp Ala Glu Ser | |
| 795 800 805 | |
| tgc ctc acc ctg gtg ccc tat acc ctg gtg tgg ccc cat cga ccc gcc | 2681 |
| Cys Leu Thr Leu Val Pro Tyr Thr Leu Val Trp Pro His Arg Pro Ala | |
| 810 815 820 825 | |
| cgg ccc cgg cct gtg ctc ctc gtg ccc agg gcg gtt ggg aag atc ctg | 2729 |
| Arg Pro Arg Pro Val Leu Leu Val Pro Arg Ala Val Gly Lys Ile Leu | |
| 830 835 840 | |
| agc gag aaa ctg tgc ctc ctc caa ggg ttt aag aag tgc ctg gca gag | 2777 |
| Ser Glu Lys Leu Cys Leu Leu Gln Gly Phe Lys Lys Cys Leu Ala Glu | |
| 845 850 855 | |
| tac ttg agc cag gag gag tat gag gcc tgg agc cag aga ggg gac atc | 2825 |
| Tyr Leu Ser Gln Glu Glu Tyr Glu Ala Trp Ser Gln Arg Gly Asp Ile | |
| 860 865 870 | |
| atc cag gag gga gag gtg tcc ggg ggc cgc tgc tgg gtg acc cgc cat | 2873 |
| Ile Gln Glu Gly Glu Val Ser Gly Gly Arg Cys Trp Val Thr Arg His | |
| 875 880 885 | |
| gct gtg gag tcc ctc atg gaa aag aac acc cat gcc ctc ctg gac gtc | 2921 |
| Ala Val Glu Ser Leu Met Glu Lys Asn Thr His Ala Leu Leu Asp Val | |
| 890 895 900 905 | |
| cag ctg gac agt gtc tgc acc ctg cac agg atg gac atc ttc ccc atc | 2969 |
| Gln Leu Asp Ser Val Cys Thr Leu His Arg Met Asp Ile Phe Pro Ile | |
| 910 915 920 | |
| gtc atc cac gtc tct gtc aac gag aag atg gca aag aag ctc aag aag | 3017 |
| Val Ile His Val Ser Val Asn Glu Lys Met Ala Lys Lys Leu Lys Lys | |
| 925 930 935 | |
| ggc cta cag cgg ttg ggc acc tca gag gag cag ctc ctg gag gct gcg | 3065 |
| Gly Leu Gln Arg Leu Gly Thr Ser Glu Glu Gln Leu Leu Glu Ala Ala | |
| 940 945 950 | |
| agg cag gag gag gga gac ctg gac cgg gcg ccc tgt cta tac agc agc | 3113 |
| Arg Gln Glu Glu Gly Asp Leu Asp Arg Ala Pro Cys Leu Tyr Ser Ser | |
| 955 960 965 | |
| ctg gct cct gac ggc tgg agc gac ctg gac ggc ctg ctc agc tgt gtc | 3161 |
| Leu Ala Pro Asp Gly Trp Ser Asp Leu Asp Gly Leu Leu Ser Cys Val | |
| 970 975 980 985 | |
| cgc cag gcc atc gcc gac gag cag aag aag gtg gtg tgg acg gag cag | 3209 |
| Arg Gln Ala Ile Ala Asp Glu Gln Lys Lys Val Val Trp Thr Glu Gln | |
| 990 995 1000 | |

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Ser Pro Arg

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35 40 45
Leu Cys Gln Leu Asp Glu Glu Glu Val Leu His Ser Pro Arg Leu Thr
50 55 60
Asn Ser Ala Met Arg Ala Gly His Leu Leu Asp Leu Leu Lys Thr Arg
65 70 75 80
Gly Lys Asn Gly Ala Ile Ala Phe Leu Glu Ser Leu Lys Phe His Asn
85 90 95
Pro Asp Val Tyr Thr Leu Val Thr Gly Leu Gln Pro Asp Val Asp Phe
100 105 110
Ser Asn Phe Ser Gly Leu Met Glu Thr Ser Lys Leu Thr Glu Cys Leu
115 120 125
Ala Gly Ala Ile Gly Ser Leu Gln Glu Glu Leu Asn Gln Glu Lys Gly
130 135 140
Gln Lys Glu Val Leu Leu Arg Arg Cys Gln Gln Leu Gln Glu His Leu
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Gly Leu Ala Glu Thr Arg Ala Glu Gly Leu His Gln Leu Glu Ala Asp
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His Ser Arg Met Lys Arg Glu Val Ser Ala His Phe His Glu Val Leu
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Arg Leu Lys Asp Glu Met Leu Ser Leu Ser Leu His Tyr Ser Asn Ala
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Leu Gln Glu Lys Glu Leu Ala Ser Arg Cys Arg Ser Leu Gln Glu
210 215 220
Glu Leu Tyr Leu Leu Lys Gln Glu Leu Gln Arg Ala Asn Met Val Ser
225 230 235 240
Ser Cys Glu Leu Glu Leu Gln Glu Gln Ser Leu Arg Thr Ala Ser Asp
245 250 255
Gln Glu Ser Gly Asp Glu Glu Leu Asn Arg Leu Lys Glu Glu Asn Glu
260 265 270

Lys Leu Arg Ser Leu Thr Phe Ser Leu Ala Glu Lys Asp Ile Leu Glu
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 Gln Ser Leu Asp Glu Ala Arg Gly Ser Arg Gln Glu Leu Val Glu Arg
 290 295 300
 Ile His Ser Leu Arg Glu Arg Ala Val Ala Glu Arg Gln Arg Glu
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 Gln Tyr Trp Glu Glu Lys Glu Gln Thr Leu Leu Gln Phe Gln Lys Ser
 325 330 335
 Lys Met Ala Cys Gln Leu Tyr Arg Glu Lys Val Asn Ala Leu Gln Ala
 340 345 350
 Gln Val Cys Glu Leu Gln Lys Glu Arg Asp Gln Ala Tyr Ser Ala Arg
 355 360 365
 Asp Ser Ala Gln Arg Glu Ile Ser Gln Ser Leu Val Glu Lys Asp Ser
 370 375 380
 Leu Arg Arg Gln Val Phe Glu Leu Thr Asp Gln Val Cys Glu Leu Arg
 385 390 395 400
 Thr Gln Leu Arg Gln Leu Gln Ala Glu Pro Pro Gly Val Leu Lys Gln
 405 410 415
 Glu Ala Arg Thr Arg Glu Pro Cys Pro Arg Glu Lys Gln Arg Leu Val
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 Arg Met His Ala Ile Cys Pro Arg Asp Asp Ser Asp Cys Ser Leu Val
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 Asp Ala Leu Leu Glu Gln Ile Ser Val Ile Gly Gly Asn Leu Thr Gly
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 Gly Leu Leu Arg Arg Val Asp Gly Phe Cys Cys Leu Ser Val Lys Val
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 Ala Thr Ser Gly Asp Ser Phe Tyr Ile Arg Val Asn Leu Ala Met Glu
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 Val Asn Ser Tyr Thr Met Lys Asp Thr Ala Ala His Gly Thr Ile Pro

| | | | | | | |
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| tctgtgagc | tggaattgca | agacgagtc | ctgaggacag | ccagcgacca | ggagtcggg | 780 |
| gatgaggagc | tgaaccgcct | gaaggaggag | aatgagaaac | tgcgtctcgt | gactttcagc | 840 |
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Glu Thr Leu Trp Glu Met Met Glu Ser His Arg His Arg Ile Val Arg
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tgc atc tgc ccc agc cgc ctc acc ccc tac ctg cgc cag gcc aag gtg 144
Cys Ile Cys Pro Ser Arg Leu Thr Pro Tyr Leu Arg Gln Ala Lys Val

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| | | | | | | | | | | | | | | | | | | |
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| | | | 35 | | | 40 | | | | | | 45 | | | | | | |
| ctg | tgc | cag | ctg | gac | gag | gag | gag | gtg | ctg | cac | agc | ccc | cgg | ctc | acc | | 192 | |
| Leu | Cys | Gln | Leu | Asp | Glu | Glu | Glu | Val | Leu | His | Ser | Pro | Arg | Leu | Thr | | | |
| | | | 50 | | | 55 | | | 60 | | | | | | | | | |
| aac | agc | gcc | atg | cgg | gcc | ggg | cac | ttg | ctg | gat | ttg | ctg | aag | act | cga | | 240 | |
| Asn | Ser | Ala | Met | Arg | Ala | Gly | His | Leu | Leu | Asp | Leu | Leu | Lys | Thr | Arg | | | |
| | | | 65 | | | 70 | | | 75 | | | 80 | | | | | | |
| ggg | aag | aac | ggg | gcc | atc | gcc | ttc | ctg | gag | agc | ctg | aag | ttc | cac | aac | | 288 | |
| Gly | Lys | Asn | Gly | Ala | Ile | Ala | Phe | Leu | Glu | Ser | Leu | Lys | Phe | His | Asn | | | |
| | | | 85 | | | 90 | | | 95 | | | | | | | | | |
| cct | gac | gtc | tac | acc | ctg | gtc | acc | ggg | ctg | cag | cct | gat | gtt | gac | ttc | | 336 | |
| Pro | Asp | Val | Tyr | Thr | Leu | Val | Thr | Gly | Leu | Gln | Pro | Asp | Val | Asp | Phe | | | |
| | | | 100 | | | 105 | | | 110 | | | | | | | | | |
| agt | aac | ttt | agc | ggt | gag | agc | tcc | gac | ttt | gac | ggt | ttg | gca | ggc | act | | 384 | |
| Ser | Asn | Phe | Ser | Gly | Glu | Ser | Ser | Asp | Phe | Asp | Gly | Leu | Ala | Gly | Thr | | | |
| | | | 115 | | | 120 | | | 125 | | | | | | | | | |
| tct | agg | aac | ctc | agg | ctc | ctg | gta | acc | cca | ggt | ctc | atg | gag | aca | tcc | | 432 | |
| Ser | Arg | Asn | Leu | Arg | Leu | Leu | Val | Thr | Pro | Gly | Leu | Met | Glu | Thr | Ser | | | |
| | | | 130 | | | 135 | | | 140 | | | | | | | | | |
| aag | ctg | acc | gag | tgc | ctg | gct | ggg | gcc | atc | ggc | agc | ctg | cag | gag | gag | | 480 | |
| Lys | Leu | Thr | Glu | Cys | Leu | Ala | Gly | Ala | Ile | Gly | Ser | Leu | Gln | Glu | Glu | | | |
| | | | 145 | | | 150 | | | 155 | | | 160 | | | | | | |
| ctg | aac | cag | gaa | aag | ggg | cag | aag | gag | gtg | ctg | ctg | cgg | cgg | tgc | cag | | 528 | |
| Leu | Asn | Gln | Glu | Lys | Gly | Gln | Lys | Glu | Val | Leu | Leu | Arg | Arg | Cys | Gln | | | |
| | | | 165 | | | 170 | | | 175 | | | | | | | | | |
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| Gln | Leu | Gln | Glu | His | Leu | Gly | Leu | Ala | Glu | Thr | Arg | Ala | Glu | Gly | Leu | | | |
| | | | 180 | | | 185 | | | 190 | | | | | | | | | |
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| His | Gln | Leu | Glu | Ala | Asp | His | Ser | Arg | Met | Lys | Arg | Glu | Val | Ser | Ala | | | |
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| His | Phe | His | Glu | Val | Leu | Arg | Leu | Lys | Asp | Glu | Met | Leu | Ser | Leu | Ser | | | |
| | | | 210 | | | 215 | | | 220 | | | | | | | | | |
| ctg | cac | tat | agc | aat | gcg | ctg | cag | gag | aag | gag | ctg | gcc | gcc | tca | cgc | | 720 | |
| Leu | His | Tyr | Ser | Asn | Ala | Leu | Gln | Glu | Lys | Glu | Leu | Ala | Ala | Ser | Arg | | | |
| | | | 225 | | | 230 | | | 235 | | | 240 | | | | | | |
| tgc | cgc | agc | ctg | cag | gag | gag | ctg | tat | cta | ctg | aag | cag | gag | ctg | cag | | 768 | |
| Cys | Arg | Ser | Leu | Gln | Glu | Glu | Leu | Tyr | Leu | Leu | Lys | Gln | Glu | Leu | | | | |

| | |
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| 275 280 285 | |
| ctg aag gag gag aat gag aaa ctg cgc tgc ctg act ttc agc ctg gcg | 912 |
| Leu Lys Glu Glu Asn Glu Lys Leu Arg Ser Leu Thr Phe Ser Leu Ala | |
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| Glu Lys Asp Ile Leu Glu Gln Ser Leu Asp Glu Ala Arg Gly Ser Arg | |
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| cag gag ctg gtg gag cgc atc cac tgc ctg cgg gag cgg gcc gtg gct | 1008 |
| Gln Glu Leu Val Glu Arg Ile His Ser Leu Arg Glu Arg Ala Val Ala | |
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| gcc gag agg cag cga gag cag gcc aga ccc tca gag ctg ctg agc ttc | 1056 |
| Ala Glu Arg Gln Arg Glu Gln Ala Arg Pro Ser Glu Leu Leu Ser Phe | |
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| Thr Val His Val Ser His Ser Val Gln Tyr Trp Glu Glu Lys Glu Gln | |
| 355 360 365 | |
| acc ctg ctg cag ttc cag aag agt aag atg gcc tgc caa ctc tac agg | 1152 |
| Thr Leu Leu Gln Phe Gln Lys Ser Lys Met Ala Cys Gln Leu Tyr Arg | |
| 370 375 380 | |
| gag aag gtg aat gcg ctg cag gcc cag gtg tgc gag ctg cag aag gag | 1200 |
| Glu Lys Val Asn Ala Leu Gln Ala Gln Val Cys Glu Leu Gln Lys Glu | |
| 385 390 395 400 | |
| cga gac cag gcg tac tcc gcg agg gac agt gct cag agg gag att tcc | 1248 |
| Arg Asp Gln Ala Tyr Ser Ala Arg Asp Ser Ala Gln Arg Glu Ile Ser | |
| 405 410 415 | |
| cag agc ctg gtg gag aag gac tcc ctc cgc agg cag gtg ttc gag ctg | 1296 |
| Gln Ser Leu Val Glu Lys Asp Ser Leu Arg Arg Gln Val Phe Glu Leu | |
| 420 425 430 | |
| acg gac cag gtc tgc gag ctg cgc aca cag ctt cgc cag ctg cag gca | 1344 |
| Thr Asp Gln Val Cys Glu Leu Arg Thr Gln Leu Arg Gln Leu Gln Ala | |
| 435 440 445 | |
| gag cct ccg ggt gtg ctc aag cag gaa gcc agg acc agg gag ccc tgt | 1392 |
| Glu Pro Pro Gly Val Leu Lys Gln Glu Ala Arg Thr Arg Glu Pro Cys | |
| 450 455 460 | |
| cca cgg gag aag cag cgg ctg gtg cgg atg cat gcc atc tgc ccc aga | 1440 |
| Pro Arg Glu Lys Gln Arg Leu Val Arg Met His Ala Ile Cys Pro Arg | |
| 465 470 475 480 | |
| gac gac agc gac tgc agc ctc gtc agc tcc aca gag tct cag ctc ttg | 1488 |
| Asp Asp Ser Asp Cys Ser Leu Val Ser Ser Thr Glu Ser Gln Leu Leu | |
| 485 490 495 | |

| | |
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| tcg gac ctg agt gcc acg tcc agc cgc gag ctg gtg gac agc ttc cgc | 1536 |
| Ser Asp Leu Ser Ala Thr Ser Ser Arg Glu Leu Val Asp Ser Phe Arg | |
| 500 505 510 | |
| tcc agc agc ccc gcg ccc ccc agc cag cag tcc ctg tac aag cgg gtg | 1584 |
| Ser Ser Ser Pro Ala Pro Pro Ser Gln Gln Ser Leu Tyr Lys Arg Val | |
| 515 520 525 | |
| gcc gag gac ttc ggg gaa gaa ccc tgg tct ttc agc agc tgc ctg gag | 1632 |
| Ala Glu Asp Phe Gly Glu Glu Pro Trp Ser Phe Ser Ser Cys Leu Glu | |
| 530 535 540 | |
| atc ccg gag gga gac ccg gga gcc ctg ccg gga gct aag gca ggc gac | 1680 |
| Ile Pro Glu Gly Asp Pro Gly Ala Leu Pro Gly Ala Lys Ala Gly Asp | |
| 545 550 555 560 | |
| cca cac ctg gat tat gag ctc cta gac acg gca gac ctt ccg cag ctg | 1728 |
| Pro His Leu Asp Tyr Glu Leu Leu Asp Thr Ala Asp Leu Pro Gln Leu | |
| 565 570 575 | |
| gaa agc agc ctg cag cca gtc tcc cct gga agg ctt gat gtc tcg gag | 1776 |
| Glu Ser Ser Leu Gln Pro Val Ser Pro Gly Arg Leu Asp Val Ser Glu | |
| 580 585 590 | |
| agt gca caa gcc ggt cgt ctc ccg gcc tgc agc ggc gtc ctc atg cgg | 1824 |
| Ser Ala Gln Ala Gly Arg Leu Pro Ala Cys Ser Gly Val Leu Met Arg | |
| 595 600 605 | |
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| Arg Arg Pro Ala Arg Arg Ile Leu Ser Gln Val Thr Met Leu Ala Phe | |
| 610 615 620 | |
| cag ggg gat gca ttg ctg gag cag atc agc gtc atc ggc ggg aac ctc | 1920 |
| Gln Gly Asp Ala Leu Leu Glu Gln Ile Ser Val Ile Gly Gly Asn Leu | |
| 625 630 635 640 | |
| acg ggc atc ttc atc cac cgg gtc acc ccg ggc tcg gcg gcg gac cag | 1968 |
| Thr Gly Ile Phe Ile His Arg Val Thr Pro Gly Ser Ala Ala Asp Gln | |
| 645 650 655 | |
| atg gcc ttg cgc ccg ggc acc cag att gtg atg gtt gat tac gaa gcc | 2016 |
| Met Ala Leu Arg Pro Gly Thr Gln Ile Val Met Val Asp Tyr Glu Ala | |
| 660 665 670 | |
| tca gag ccc ttg ttc aag gca gtc ctg gag gac acg acc ctg gag gag | 2064 |
| Ser Glu Pro Leu Phe Lys Ala Val Leu Glu Asp Thr Thr Leu Glu Glu | |
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| Lys Val Asn Thr Asp Gly Tyr Lys Arg Leu Leu Gln Asp Leu Glu Ala | |
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| aaa gtg gcg acc tcg ggg gac tca ttc tac atc cgg gtc aac ctg gcc | 2208 |

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| 725 730 735 | |
| atg gag ggc agg gcc aaa ggg gag ctg cag gtg cat tgc aac gag gtc | 2256 |
| Met Glu Gly Arg Ala Lys Gly Glu Leu Gln Val His Cys Asn Glu Val | |
| 740 745 750 | |
| ctg cac gtc acc gac acc atg ttc cag ggc tgc ggc tgc tgg cat gcc | 2304 |
| Leu His Val Thr Asp Thr Met Phe Gln Gly Cys Gly Cys Trp His Ala | |
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| His Arg Val Asn Ser Tyr Thr Met Lys Asp Thr Ala Ala His Gly Thr | |
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| Asp Met Thr Gln Gln Cys Thr Val Thr Arg Lys Pro Ser Ser Gly Gly | |
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| Pro Gln Lys Leu Val Arg Ile Val Ser Met Asp Lys Ala Lys Ala Ser | |
| 820 825 830 | |
| cct ctg cgt ttg tcc ttt gac agg ggc cag ttg gac ccc agc agg atg | 2544 |
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| Glu Gly Ser Ser Thr Cys Phe Trp Ala Glu Ser Cys Leu Thr Leu Val | |
| 850 855 860 | |
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| Pro Tyr Thr Leu Val Arg Pro His Arg Pro Ala Arg Pro Arg Pro Val | |
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| ctc ctc caa ggg ttt aag aag tgc ctg gca gag tac ttg agc cag gag | 2736 |
| Leu Leu Gln Gly Phe Lys Lys Cys Leu Ala Glu Tyr Leu Ser Gln Glu | |
| 900 905 910 | |
| gag tat gag gcc tgg agc cag aga ggg gac atc atc cag gag gga gag | 2784 |
| Glu Tyr Glu Ala Trp Ser Gln Arg Gly Asp Ile Ile Gln Glu Gly Glu | |
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| gtg tcc ggg ggc cgc tgc tgg gtg acc cgc cat gct gtg gag tcc ctc | 2832 |
| Val Ser Gly Gly Arg Cys Trp Val Thr Arg His Ala Val Glu Ser Leu | |
| 930 935 940 | |
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| Met Glu Lys Asn Thr His Ala Leu Leu Asp Val Gln Leu Asp Ser Val | |

| 945 | 950 | 955 | 960 | |
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| tgc acc ctg cac agg atg gac atc ttc ccc atc gtc atc cac gtc tct | | | | 2928 |
| Cys Thr Leu His Arg Met Asp Ile Phe Pro Ile Val Ile His Val Ser | 965 | 970 | 975 | |
| gtc aac gag aag atg gca aag aag ctc aag aag ggc cta cag cgg ttg | | | | 2976 |
| Val Asn Glu Lys Met Ala Lys Lys Leu Lys Lys Gly Leu Gln Arg Leu | 980 | 985 | 990 | |
| ggc acc tca gag gag cag ctc ctg gag gct gcg agg cag gag gag gga | | | | 3024 |
| Gly Thr Ser Glu Glu Gln Leu Leu Glu Ala Ala Arg Gln Glu Glu Gly | 995 | 1000 | 1005 | |
| gac ctg gac cgg gcg ccc tgt cta tac agc agc ctg gct cct gac ggc | | | | 3072 |
| Asp Leu Asp Arg Ala Pro Cys Leu Tyr Ser Ser Leu Ala Pro Asp Gly | 1010 | 1015 | 1020 | |
| tgg agc gac ctg gac ggc ctg ctc agc tgt gtc cgc cag gcc atc gcc | | | | 3120 |
| Trp Ser Asp Leu Asp Gly Leu Leu Ser Cys Val Arg Gln Ala Ile Ala | 1025 | 1030 | 1035 1040 | |
| gac gag cag aag aag gtg caa cgc cga cgt cat cca aga att aac cca | | | | 3168 |
| Asp Glu Gln Lys Lys Val Gln Arg Arg Arg His Pro Arg Ile Asn Pro | 1045 | 1050 | 1055 | |
| agc cag agg acg ggc atc gcc acc cag caa cgc cag tgt cac cga aga | | | | 3216 |
| Ser Gln Arg Thr Gly Ile Ala Thr Gln Gln Arg Gln Cys His Arg Arg | 1060 | 1065 | 1070 | |
| att aac cca agg cag agg atg ggc att gcc acc cag caa cgc cag tgt | | | | 3264 |
| Ile Asn Pro Arg Gln Arg Met Gly Ile Ala Thr Gln Gln Arg Gln Cys | 1075 | 1080 | 1085 | |
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| His Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Thr Thr Gln Gln | 1090 | 1095 | 1100 | |
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| Cys Gln Cys His Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Ala | 1105 | 1110 | 1115 1120 | |
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 Ile Cys Pro Ser Arg Leu Thr Pro Tyr Leu Arg Gln Ala Lys Val Leu
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 Phe His Glu Val Leu Arg Leu Lys Asp Glu Met Leu Ser Leu Ser Leu
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 Arg Ser Leu Gln Glu Glu Leu Tyr Leu Leu Lys Gln Glu Leu Gln Arg
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 Arg Thr Ala Ser Asp Gln Glu Ser Gly Asp Glu Glu Leu Asn Arg Leu
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 Lys Glu Glu Asn Glu Lys Leu Arg Ser Leu Thr Phe Ser Leu Ala Glu
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 Asp Gln Ala Tyr Ser Ala Arg Asp Ser Ala Gln Arg Glu Ile Ser Gln
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 Ser Leu Val Glu Lys Asp Ser Leu Arg Arg Gln Val Phe Glu Leu Thr
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 Asp Gln Val Cys Glu Leu Arg Thr Gln Leu Arg Gln Leu Gln Ala Glu
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 Pro Pro Gly Val Leu Lys Gln Glu Ala Arg Thr Arg Glu Pro Cys Pro
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 Arg Glu Lys Gln Arg Leu Val Arg Met His Ala Ile Cys Pro Arg Asp

| | | | | | | |
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| Asp Ser Asp Cys Ser | Leu Val Ser Ser | Thr Glu Ser Gln | Leu Leu Ser | | | |
| | 485 | 490 | 495 | | | |
| Asp Leu Ser Ala Thr | Ser Ser Arg Glu | Leu Val Asp Ser | Phe Arg Ser | | | |
| | 500 | 505 | 510 | | | |
| Ser Ser Pro Ala Pro | Pro Ser Gln Gln | Ser Leu Tyr Lys | Arg Val Ala | | | |
| | 515 | 520 | 525 | | | |
| Glu Asp Phe Gly Glu | Glu Pro Trp Ser | Phe Ser Ser Cys | Leu Glu Ile | | | |
| | 530 | 535 | 540 | | | |
| Pro Glu Gly Asp Pro | Gly Ala Leu Pro | Gly Ala Lys Ala | Gly Asp Pro | | | |
| | 545 | 550 | 555 | | | 560 |
| His Leu Asp Tyr Glu | Leu Leu Asp Thr | Ala Asp Leu Pro | Gln Leu Glu | | | |
| | 565 | 570 | 575 | | | |
| Ser Ser Leu Gln Pro | Val Ser Pro Gly | Arg Leu Asp Val | Ser Glu Ser | | | |
| | 580 | 585 | 590 | | | |
| Ala Gln Ala Gly Arg | Leu Pro Ala Cys | Ser Gly Val Leu | Met Arg Arg | | | |
| | 595 | 600 | 605 | | | |
| Arg Pro Ala Arg Arg | Ile Leu Ser Gln | Val Thr Met Leu | Ala Phe Gln | | | |
| | 610 | 615 | 620 | | | |
| Gly Asp Ala Leu Leu | Glu Gln Ile Ser | Val Ile Gly Gly | Asn Leu Thr | | | |
| | 625 | 630 | 635 | | | 640 |
| Gly Ile Phe Ile His | Arg Val Thr Pro | Gly Ser Ala Ala | Asp Gln Met | | | |
| | 645 | 650 | 655 | | | |
| Ala Leu Arg Pro Gly | Thr Gln Ile Val | Met Val Asp Tyr | Glu Ala Ser | | | |
| | 660 | 665 | 670 | | | |
| Glu Pro Leu Phe Lys | Ala Val Leu Glu | Asp Thr Thr Leu | Glu Glu Ala | | | |
| | 675 | 680 | 685 | | | |
| Val Gly Leu Leu Arg | Arg Val Asp Gly | Phe Cys Cys Leu | Ser Val Lys | | | |
| | 690 | 695 | 700 | | | |
| Val Asn Thr Asp Gly | Tyr Lys Arg Leu | Leu Gln Asp Leu | Glu Ala Lys | | | |
| | 705 | 710 | 715 | | | 720 |
| Val Ala Thr Ser Gly | Asp Ser Phe Tyr | Ile Arg Val Asn | Leu Ala Met | | | |
| | 725 | 730 | 735 | | | |
| Glu Gly Arg Ala Lys | Gly Glu Leu Gln | Val His Cys Asn | Glu Val Leu | | | |
| | 740 | 745 | 750 | | | |
| His Val Thr Asp Thr | Met Phe Gln Gly | Cys Gly Cys Trp | His Ala His | | | |
| | 755 | 760 | 765 | | | |
| Arg Val Asn Ser Tyr | Thr Met Lys Asp | Thr Ala Ala His | Gly Thr Ile | | | |
| | 770 | 775 | 780 | | | |
| Pro Asn Tyr Ser Arg | Ala Gln Gln Gln | Leu Ile Ala Leu | Ile Gln Asp | | | |
| | 785 | 790 | 795 | | | 800 |
| Met Thr Gln Gln Cys | Thr Val Thr Arg | Lys Pro Ser Ser | Gly Gly Pro | | | |
| | 805 | 810 | 815 | | | |
| Gln Lys Leu Val Arg | Ile Val Ser Met | Asp Lys Ala Lys | Ala Ser Pro | | | |
| | 820 | 825 | 830 | | | |
| Leu Arg Leu Ser Phe | Asp Arg Gly Gln | Leu Asp Pro Ser | Arg Met Glu | | | |
| | 835 | 840 | 845 | | | |
| Gly Ser Ser Thr Cys | Phe Trp Ala Glu | Ser Cys Leu Thr | Leu Val Pro | | | |
| | 850 | 855 | 860 | | | |
| Tyr Thr Leu Val Arg | Pro His Arg Pro | Ala Arg Pro Arg | Pro Val Leu | | | |
| | 865 | 870 | 875 | | | 880 |
| Leu Val Pro Arg Ala | Val Gly Lys Ile | Leu Ser Glu Lys | Leu Cys Leu | | | |
| | 885 | 890 | 895 | | | |
| Leu Gln Gly Phe Lys | Lys Cys Leu Ala | Glu Tyr Leu Ser | Gln Glu Glu | | | |
| | 900 | 905 | 910 | | | |
| Tyr Glu Ala Trp Ser | Gln Arg Gly Asp | Ile Ile Gln Glu | Gly Glu Val | | | |
| | 915 | 920 | 925 | | | |

Ser Gly Gly Arg Cys Trp Val Thr Arg His Ala Val Glu Ser Leu Met
 930 935 940
 Glu Lys Asn Thr His Ala Leu Leu Asp Val Gln Leu Asp Ser Val Cys
 945 950 955 960
 Thr Leu His Arg Met Asp Ile Phe Pro Ile Val Ile His Val Ser Val
 965 970 975
 Asn Glu Lys Met Ala Lys Lys Leu Lys Lys Gly Leu Gln Arg Leu Gly
 980 985 990
 Thr Ser Glu Glu Gln Leu Leu Glu Ala Ala Arg Gln Glu Glu Gly Asp
 995 1000 1005
 Leu Asp Arg Ala Pro Cys Leu Tyr Ser Ser Leu Ala Pro Asp Gly Trp
 1010 1015 1020
 Ser Asp Leu Asp Gly Leu Leu Ser Cys Val Arg Gln Ala Ile Ala Asp
 1025 1030 1035 1040
 Glu Gln Lys Lys Val Gln Arg Arg Arg His Pro Arg Ile Asn Pro Ser
 1045 1050 1055
 Gln Arg Thr Gly Ile Ala Thr Gln Gln Arg Gln Cys His Arg Arg Ile
 1060 1065 1070
 Asn Pro Arg Gln Arg Met Gly Ile Ala Thr Gln Gln Arg Gln Cys His
 1075 1080 1085
 Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Thr Thr Gln Gln Cys
 1090 1095 1100
 Gln Cys His Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Ala Met
 1105 1110 1115 1120
 Pro Ser Ser Ser Asp Thr Leu Lys Lys Asp Lys Leu Leu Pro Arg Asn
 1125 1130 1135
 Thr Thr

<210> 6

<211> 90

<212> PRT

<213> Artificial Sequence

<220>

<223> consensus sequence

<400> 6

Ala Glu Asp Asp Arg Arg Leu Leu Arg Lys Asn Arg Leu Glu Leu Leu
 1 5 10 15
 Gly Glu Leu Thr Leu Ser Gly Leu Leu Asp His Leu Leu Glu Lys Asn
 20 25 30
 Val Leu Thr Glu Glu Glu Glu Lys Ile Lys Ala Lys Asn Thr Thr
 35 40 45
 Arg Arg Asp Lys Ala Arg Glu Leu Ile Asp Ser Val Gln Lys Lys Gly
 50 55 60
 Asn Gln Ala Phe Gly Ile Phe Leu Gln Ala Leu Arg Glu Thr Asp Gly
 65 70 75 80
 Glu Leu Leu Ala Asp Leu Leu Leu Asp Glu
 85 90

<210> 7

<211> 83

<212> PRT

<213> Artificial Sequence

<220>

<223> consensus sequence

<400> 7

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Glu Ile Thr Leu Glu Lys Glu Val Lys Arg Gly Gly Leu Gly Phe Ser
 1           5           10           15
Ile Lys Gly Gly Ser Asp Lys Gly Ile Val Val Ser Glu Val Leu Pro
      20           25           30
Gly Ser Gly Ala Ala Glu Ala Gly Arg Leu Lys Glu Gly Asp Val
      35           40           45
Ile Leu Ser Val Asn Gly Gln Asp Val Glu Asn Met Ser His Glu Arg
      50           55           60
Ala Val Leu Ala Ile Lys Gly Ser Gly Gly Glu Val Thr Leu Thr Val
      65           70           75           80
Leu Arg Asp

```

<210> 8

<211> 58

<212> PRT

<213> Artificial Sequence

<220>

<223> consensus sequence

<400> 8

```

Glu Tyr Val Val Ala Leu Tyr Asp Tyr Glu Ala Gln Asn Glu Asp Glu
 1           5           10           15
Leu Ser Phe Lys Lys Gly Asp Ile Ile Thr Val Leu Glu Lys Ser Asp
      20           25           30
Asp Gly Trp Trp Glu Gly Glu Leu Asn Arg Thr Gly Lys Glu Gly Leu
      35           40           45
Phe Pro Ser Asn Tyr Val Glu Ile Glu
      50           55

```

<210> 9

<211> 108

<212> PRT

<213> Artificial Sequence

<220>

<223> consensus sequence

<400> 9

```

Thr Arg Pro Val Pro Arg Pro Gly Glu Val Asp Gly Lys Asp Tyr His
 1           5           10           15
Phe Val Ser Ser Arg Glu Glu Met Glu Lys Asp Ile Ala Ala Asn Glu
      20           25           30
Phe Leu Glu Tyr Gly Glu Phe Gln Gly Asn Tyr Tyr Gly Thr Ser Leu
      35           40           45
Glu Thr Val Arg Gln Val Ala Lys Gln Gly Lys Ile Cys Ile Leu Asp
      50           55           60
Val Glu Pro Gln Gly Val Lys Arg Leu Arg Thr Ala Glu Leu Ser Asn
      65           70           75           80
Pro Ile Val Val Phe Ile Ala Pro Pro Ser Leu Gln Glu Leu Glu Lys
      85           90           95
Arg Leu Glu Gly Arg Asn Lys Glu Ser Glu Glu Ser
      100           105

```

<220>
<223> consensus sequence

| | | | | | | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 10 | | | | | | | | | | | | | | | |
| Asp | Ser | Tyr | Gln | Lys | Ser | Ser | Gly | Asn | Ser | Ser | Leu | Trp | Glu | Ser | Asn |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Tyr | Gln | Asn | Trp | Gln | Gln | Glu | Ala | Ala | Lys | Leu | Lys | Ala | Gln | Ile | Glu |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Asn | Leu | Gln | Asn | Asn | Arg | Asn | Gln | Arg | His | Leu | Leu | Gly | Glu | Asp | Leu |
| | | | 35 | | | | 40 | | | | | 45 | | | |
| Gly | Ser | Leu | Ser | Leu | Lys | Glu | Leu | Gln | Gln | Leu | Glu | Gln | Gln | Leu | Glu |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Lys | Gly | Leu | Lys | His | Ile | Arg | Ser | Arg | Lys | Asn | Gln | Leu | Leu | Leu | Asp |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Gln | Ile | Glu | Glu | Leu | Gln | Lys | Lys | Glu | Arg | Glu | Leu | Gln | Glu | Glu | Asn |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Lys | Ala | Leu | Arg | Lys | Lys | Ile | Glu | Glu | | | | | | | |
| | | | 100 | | | | | 105 | | | | | | | |